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ABSTRACT

Boundary spanning in colleges as evidenced through the activity of offices of institutional research was studied. Literature in organization theory suggests that those institutions that adapt most rapidly to changes in their external environment are those that establish formal structures (boundary spanning roles) for monitoring that environment. Two hypotheses were tested: offices of institutional research are primary boundary spanners in postsecondary institutions; and the manner in which the office is structured and staffed is related to the overall adaptability of the institutions. The study sample consisted of 173 public and private colleges in nine northeast and mid-Atlantic states. In addition to collecting demographic information concerning the institution and the boundary role incumbent, the structure of the role was assessed (whether an institutional research office exists, and the number of roles held by the office incumbent). The survey also focused on trend data on enrollment and workload as a measure of boundary flexibility, and on the professionalization of the boundary role as measured by training, professional authority, and demonstrable professional culture. Study findings and implications for colleges faced with environmental uncertainty are discussed. (SW)

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An Empirical Evaluation of Boundary Spanning as a Conceptual Framework for Examining the Organizational Roles of Offices of Institutional Research

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THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

This paper was presented at the Twenty-Fourth Annual Forum of the Association for Institutional Research held at the Hyatt-Regency in Fort Worth, Texas, May 6-9, 1984. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum papers.

Daniel R. Coleman, Chairman
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This paper, and the hours and effort that went into it, are dedicated to Margaret Coupe. A dear and valued friend, she saw the author through the most difficult personal year of his life and gave him the strength and encouragement to perservere on the professional front. All the wealth in the world palls next to this woman's friendship. The Bard of Stratford was correct:

> "But if the while I think on thee, dear friend;
> All losses are restored, and sorrows end."

Thank you, Margaret.

Abstract

This paper reviews the literature in organization theory that suggests that those institutions which adapt most rapidly to changes in their external environment are those which establish formal structures (boundary spanning roles) for monitoring that environment. The author posits that offices of institutional research are primary boundary spanners in postsecondary institutions, and empirically tests the proposition that the manner in which the office is structured and staffed is related to the overall adaptability of the institution. The results of the study have implications for all colleges and universities faced with environmental uncertainty.

Introduction

Of necessity, most organizations, including colleges and universities, interact with a variety of other formal and informal organizations. These interactions are necessary to secure resources (i.e., money, raw materials, and personnel essential to the activity of the organization) and product markets. Interinstitutional activity assumes a wide variety of forms, and typologies and schemata describing these are well documented in organizational literature. (Thompson and McEwen, 1958; Levine and White, 1962; Seashore and Yuchtman, 1967) Those organizations and groups external to the focal institution with which that unit must interact in order to carry out its own mission are termed the "organizational environment." (Katz and Kahn, 1966)

The interaction between an organization and other organizations and groups in its environment is analogous to the biological principle of natural selection. (Aldrich and Pfeffer, 1976) Just as living organisms must adapt to their environment, that is, obtain adequate food supplies, shelter, and reproduce in sufficient numbers or face extinction, organizations too must adapt to their environment if they are to remain viable institutions. Organizational adaptation may be studied in terms of institutional transactions with the environment which permit the acquisition of the necessary resources for operation and the securance of product markets. (Aldrich and Pfeffer, 1976; Aldrich and Herker, 1979)

The interactions between a focal institution and other organizations in its environment involve a series of transactions across the boundaries of the respective organizations. (Katz and Kahn, 1966; Thompson, 1967; Starbuck, 1977) These transactions are generally concerned with the intake of resources for institutional activity and with the establishment of product markets. A characteristic of adaptive organizations may be the identification of crucial components of the environment (i.e., suppliers of scarce resources and markets for the

organizational product) and the establishment of "boundary spanning roles" to deal with them. (Thompson, 1967; Aldrich and Herker; 1977) Boundary spanners are those individuals who carry out the transactions between the organization and its environment.

Adaptive organizations characteristically have flexible boundaries, that is, they are able to continuously secure resources and product markets within the context of a constantly changing organizational environment. (Aldrich and Pfeffer; 1976) This study focuses on boundary spanning in colleges and universities as evidenced through the activity of offices of institutional research. The study focuses on the institutional research boundary spanning role to determine the relationship between the presence or absence of the role and the organizational boundary flexibility of the college or university. Additionally, certain structural characteristics of the boundary spanning role will be examined to determine their relationship to boundary flexibility.

Rationale for the Study

Thompson (1967), Aldrich and Herker (1977), and others have suggested that organizations, faced with a complex external environment, may identify the critical components of that environment and establish boundary spanning roles to deal with them. The central thesis of this study is that institutional research offices are ideal environment scanners, and those colleges and universities which fully and systematically support the institutional research role will have greater boundary flexibility than those which do not do so. That is, they will be able to continuously secure adequate levels of student enrollments as the result of offering programs and services that are responsive not only to student needs but to the training demands and requirements of the society that accepts the institution's graduates. The function of the institutional research boundary spanner is the constant monitoring of student and societal programmatic

demands in the face of a constantly changing external environment.

However, the degree of success in boundary spanning activities may be controlled by structural characteristics imposed upon the boundary spanning role itself. It is argued here that the degree of presence or absence of the institutional research function, the extent to which the institutional research role is unencumbered by other institutional roles, and the extent to which the institutional research role is professionalized, all impact upon the level of boundary spanning activity and boundary flexibility. (Aldrich and Herker, 1977)

The concept of a rapidly changing organizational environment was proposed by Emery and Trist (1966) and has been reinforced by the work of Terreberry (1968) and Liefer and Huber (1977). Terreberry (1968) suggested that nearly all complex organizations operate within a rapidly changing or "turbulent field" environment. These environments are characterized by uncertainty both with respect to continued supplies of resources and with respect to the activities of other organizations within the environment. That colleges and enrollments operate in a turbulent field environment is clearly evident in interinstitutional competition for a shrinking student pool, constricting government and foundation monies, and the apparent conflict between the traditional concept of humanistic education and the training needs of contemporary technologically-oriented society. The turbulence of the post-secondary institutional environment is well documented. (Hingle and Norris, 1981; Cameron, 1983; Keller, 1983; Cameron, 1984) Liefer and Huber (1977) have argued that the adaptive organization will be that which acknowledges the complexity of the external environment and takes appropriate steps to cope with it.

The organization, i.e., college or university, is a problem-facing, problem-solving phenomenon. It is generally assumed that problem solving in colleges and universities is a rational process wherein all options are considered and

the optimum is selected on the basis of cost effectiveness and contribution to institutional mission. (Dror, 1968; Allison, 1971). However, it has been suggested that the very complexity of the environment which generates the problems faced by an organization is such that it would overtax the limits of human rationality were the attempt made to fully understand it. Thus, the overwhelming nature of environmental complexity forces organizations to operate within the context of "bounded rationality." Thompson (1967) summarizes:

> "The focus is on organizational processes related to choice of courses of action which does not fully disclose the alternatives. In this view, the organization has limited capacity to gather and process information or to predict consequences of alternatives. To deal with situations of such great complexity, the organization must develop processes for searching and learning as well as deciding. The complexity, if fully faced, would overwhelm the organization, hence it must set limits on its definitions of situations; it must make decisions in bounded rationality." (p. 9)

Faced with environmental uncertainty, the adaptive organization, operating under norms of bounded rationality, establishes boundary spanning roles as the vehicles for searching and learning in the environment. Having identified the crucial components of the organizational environment, boundary spanners are charged with monitoring those segments of the environment. Institutional research offices, through the inherent nature of their functions, should serve as a primary boundary spanner in searching and learning about the environment as well as monitoring crucial components of the environment. Marketing studies, attrition-retention analyses, job placement records, student/alumni opinion surveys, etc. All are directed at defining the environment. The more expansive the activity associated with the role, the more comprehensive should be

the understanding of the environment, and the more capable the institution in adapting to it. (Thompson, 1967; Aldrich and Herker, 1977; Aldrich, 1979)

Research Assertion #1: Those colleges and universities which establish a comprehensive institutional research role will have significantly greater boundary flexibility than those institutions which do not do so.

The relationship between the degree of presence or absence of boundary spanning roles and organizational boundary flexibility may be moderated by certain structural characteristics imposed upon those roles. (Aldrich and Herker, 1977; Aldrich, 1979) This study focuses upon the number of additional non-critical roles assigned to the institutional researcher over and above what might be viewed as boundary spanning activity, and the professionalization of the institutional research role. Each of these structural variables is examined in terms of significant relationship to boundary flexibility.

The number of boundary spanning roles conferred upon a given actor is frequently a function of organization size. (Aldrich and Herker, 1977) In a small college, for example, it is not uncommon to find the institutional research function performed by the registrar or development officer, each of whom has a significant organizational responsibility in his/her own right. Kahn et al (1964) warn against the danger of role overload, that is, the assignment of a variety of roles to a single boundary spanner with the expectation that each be completed when, in fact, it is impossible to fully satisfactorily complete all of the assigned tasks within the time allotted. It is arguable that in the examples cited, the institutional research function, when properly performed, requires a level of time commitment that would detract from the registration or fundraising function, or vice-versa. Similarly, role conflict (Kahn et al, 1964; Schein, 1970), in which individuals are forced to make

a choice between two roles, is a potential problem for the boundary spanner. To force such a choice may well be at the expense of both roles.

Research Assertion #2: Those colleges and universities in which the individual(s) engaged in the institutional research function have few, if any, other organizational roles will have significantly greater boundary flexibility than institutions where this is not the case.

Role professionalization refers to the suitability of an actor for a given boundary spanning role as evidenced by the level of knowledge and skills brought to that role. Aldrich and Herker (1977) indicate that an organization's ability to adapt to environmental contingencies depends in part on the expertise of boundary role incumbents in selecting, transmitting, and interpreting information originating in the environment as well as successfully representing the organization as legitimate and desirable to that environment.

The expertise which a role incumbent evidences may be related to the professionalization of that role. Consequently, it is reasonable to expect that the more professionalized the boundary spanning role, the more effectively the activities associated with it will be executed. Hall (1975) has examined the so-called "professional model" and has drawn upon earlier studies to identify the structural dimension of the professional. Five attributes are involved:

1. Formal training in an area of knowledge that is not readily available to the laity.
2. A level of authority whereby the "professional" can direct the appropriate course of action for an organization.
3. Formal and informal sanctioning of the profession through licensure, acknowledgement of the right to privileged communication, etc.
4. Subscription to a regulative code of ethics which dictates appropriate

behavior for an individual acting in a professional capacity.

5. Professional culture wherein the individual maintains membership in relevant associations, reads publications within the field, is involved in various forms of continuing education, etc.

The structural dimensions of professionalization enumerated by Hall (1975) are similar to those described in an earlier work by Beal and Wickersham (1967). However, they note that few professions subscribe to all of the dimensions of the model. They list the medical, dental, and legal professions as the most comprehensive examples. As structural descriptors are eliminated as necessary qualifications, more and more "professions" are created. With this in mind, the study will focus on three structural components that appear to contribute the most to job performance as indicative measures of the professionalization of a boundary spanning role: Formal training, the professional authority relationship, and the concept of professional culture.

Training in the activities associated with a boundary spanning role should contribute to the expertise of the role incumbent and should add to the effectiveness with which the role activities are performed. (Greenwood, 1957; Beal and Wickersham, 1967; Hall, 1975) The broad spectrum of institutional research should be more capably performed by an individual with extensive training in social sciences, research methods, and tests and measurements, than by an individual, e.g. college registrar, who is assigned the institutional research function as an add-on to other organizational duties.

Another measure of expertise in a boundary spanning role incumbent may be the authority acknowledged to that individual by the organization to provide direction for institutional policy. The acknowledgement of professional authority is based upon the belief that the role occupant possesses the knowledge base to provide correct information for organizational decisions. (Greenwood, 1957;

Etzioni, 1964; Hall, 1975, 1977) Concrete measures of professional authority may be evident in the responses to the following questions:

1. To whom does the Office of Institutional Research report? The President?
2. Does the chief institutional research officer hold a seat in the President's cabinet or executive council?
3. What is the role of the office of institutional research in the campus planning process? Is it a leadership role or simply one of staff support?

Operation within a professional culture would also appear to be an important component of role professionalization. (Greenwood, 1957; Hall 1975) The practitioner in institutional research who regularly attends in-service workshops and seminars, who reads relevant literature within the field, and who interacts with other professionals through membership in role-related associations might be expected to be better versed in contemporary developments within the field, which in turn should enhance the successful performance of activities associated with the boundary spanning role.

Bringing together the structural dimensions of role professionalization, it is now possible to offer an encompassing assertion:

Research Assertion #3: Colleges and universities which professionalize the institutional research function will have significantly greater adaptability than those institutions which do not do so.

In summary, while organizational survival may be viewed through a "natural selection" lens, it has been argued that institutional evolution can be managed to assure the organization a niche in its environment. (Young, 1981; Hipps, 1982; Cameron, 1984) This study suggests that evolutionary management in colleges

and universities includes the establishment of unemcumbered, professionalized institutional research functions to search and learn about the organizational environment. It is postulated that the extent to which an institution adheres to the research assertions preferred in this study, the likelihood of organizational adaptability is enhanced.

Methodology

A data collection instrument was developed by the author and was administered to all public and private postsecondary institutions in Maine, Vermont, New Hampshire, New York, Massachusetts, Pennsylvania, Rhode Island, Connecticut, and Delaware, as listed in Educational Directory for 1979-80, published by the U. S. Department of Education. A total of 732 surveys were mailed; 195 institutions responded with 22 indicating that they could not supply the requested data. Thus, a total of 173 colleges and universities from 10 northeastern states constitute the respondent pool for this analysis.

The data collection instrument focused on four groups of questions. Part one was largely demographic, dealing with information about the institution and the boundary role incumbent. Part two examined the structure of the role, i.e., whether or not an institutional research office exists at the institution, the number of roles held by the office incumbent(s), the number of functions for which the office is directly responsible, etc. Part three focuses on the "professionalization" of the boundary role as measured by training, professional authority, and demonstrable professional culture. Part four dealt with trend data on enrollment and workload as a measure of boundary flexibility, the assumption being that those institutions showing stability and/or growth were adaptive, while those in decline were unresponsive to changing conditions in their environments.

Findings and Discussion

The data collection instrument was returned by 173 respondents representing

a cross section of institution types within the nine northeastern states in the population. Table 1 displays the breakout of the respondent pool by institution type:

Table 1: Respondents to IR Boundary Spanning Survey, by Institution Type

Institution Type	#	%
Public 2 Year College	56	32.4
Private 2 Year College	11	6.4
Public 4 Year College	25	14.5
Private 4 Year College	52	30.1
Public University Center	17	9.8
Private University Center	6	3.5
Other	5	2.9
Missing Information	1	0.6

Nearly two of every five respondents (actually 36.4%) to the survey have been in the institutional research field for three years or less. Only one in four (24.3%) have been in the field as long as 10 years. Table 2 shows the respondent pool arrayed by length of service in the institutional research field.

Table 2: Respondents to IR Boundary Spanning Survey, by Length of Time in Institutional Research Field

Length of Service	#	%
Less than One Year	19	11.0
One to Three Years	44	25.4
Four to Six Years	42	24.3
Seven to Nine Years	26	15.0
Ten or More Years	42	24.3

The potential importance of institution type and tenure in the field will become evident as the findings are discussed.

The data from the survey were grouped and organized in a manner that corresponds to the variables under examination in this study. The degree of role presence or absence, number of roles held, the level of training, professional authority, immersion in a professional culture were examined to discern measures of association with organizational adaptability.

The degree of role presence or absence was assessed through an examination of the number of separate and discreet research functions in which the respondent is regularly engaged. The extent to which the institutional research role is a pure one, i.e., not encumbered by other organizational activities, was assessed by identifying the number of separate and discreet institutional functions to which the role incumbent is assigned. Professional training was viewed as a function of highest degree earned, while professional authority was scored on the basis of responses to items measuring the extent to which the role incumbent is able to advise and shape policy at the highest institutional levels. Professional culture was assessed as a measure of respondents use of role related literature, participation in associations, seminars, continuing education, etc. which clearly pertain to the institutional research function. Finally, boundary flexibility or adaptability was assessed as a function of being able to maintain or exceed the preceeding year's full time equivalent student enrollment over a five year time frame.

The degree of association between a pair of variables was measured using the Cramer's V statistic, which is a variation on chi square and is especially appropriate for nominal variables. Cramer's V can range in value from 0.0 to 1.0, a large value indicating that a high degree of association exists. (Nie et al, 1975) Visual inspection of the data table suggests the direction

of the association. When the independent variables (degree of role presence, number of roles held, professional training, professional authority, and professional culture) were examined with the dependent variable (organizational adaptability), no pairing produced an especially strong degree of association. Table 3 displays the values of Cramer's V for each pairing of independent with dependent variable:

Table 3: Cramer's V for Pairing of Independent with Dependent Variables - Total Respondent Pool

Variable Pairing	Cramer's V
Degree of Role Presence with Organizational Adaptability	0.13081
Number of Roles Held with Organizational Adaptability	0.18901
Professional Training with Organizational Adaptability	0.13954
Professional Authority with Organizational Adaptability	0.26937
Professional Culture with Organizational Adaptability	0.20512

However, when the same analysis is performed arraying respondents by institution type, the configuration of values of Cramer's V is particularly interesting. The array is displayed in Table 4.

The relationship between the degree of role presence as measured by the number of institutional research projects regularly engaged in and organizational adaptability as measured by enrollment growth is notably stronger in public four year colleges and public university centers than in other institution types (no comment is directed to private university centers as the respondent pool totaled 6). The more activities engaged, the higher the adaptability score. The number of roles held by institutional researchers tended to be most strongly associated with adaptability in private 2 year colleges and public 4 year colleges. The direction of the association was that predicted -- the fewer roles held, the higher the adaptability score. Professional training was somewhat strongly

Table 4: Cramer's V for Pairing of Independent with Dependent Variables by Institution Type

Variable Pairings	Cramer's V						
	All Institutions	Public 2 yr Colleges	Private 2 Yr Colleges	Public 4 yr Colleges	Private 4 yr Colleges	Public University Center	Private University Center
Degree of Role Presence with Organizational Adaptability	0.13081	0.14353	0.25000	0.42803	0.28215	0.42482	0.47140
Number of Roles Held with Organizational Adaptability	0.18901	0.27561	0.53852	0.55773	0.24291	0.40941	0.50000
Professional Training with Organizational Adaptability	0.13954	0.20408	0.36515	0.35595	0.29862	0.47930	0.52042
Professional Authority with Organizational Adaptability	0.26937	0.40742	0.81394	0.68970	0.42227	0.74162	1.00000
Professional Culture with Organizational Adaptability	0.20512	0.24353	0.29930	0.42898	0.25903	0.43568	0.70711

associated with adaptability in four year institutions, and even more so in university centers. Professional authority was strongly associated with adaptability across all institution types and professional culture was showed the strongest association in public four year colleges and public university centers.

Some conjecture about the preceeding findings: The instances of institutional research offices engaging in a broad spectrum of research activities were most frequent in public four year colleges and universities. Demographic data collected on the survey showed that these particular offices had the largest staffs. Therefore, sheer size may make it possible to engage in more and varied research projects. The data in Table 4 suggest a strong association between extensive research activity and organizational adaptability. In every instance where strength of association was indicated between the number of roles held and organizational adaptability, the data suggested that fewer roles lead to higher adaptability scores. Senior institutions were more likely to hire doctorates or professional certificate holders for institutional research positions than were two year institutions. The fact that training and adaptability appear to be associated accounts for the higher Cramer's V values for those institution type. That professional culture is so strongly associated with adaptability in public colleges and universities may be a function of the fact that these institutions have larger institutional research budgets and are therefore more readily able to afford opportunities for professional reading, memberships, and in-service education. The central thread that runs through this data is that those colleges and universities which spend money on institutional research (i.e., adequate staffing for a broad range of activity, reduction of non-role related functions, hiring trained staff, and providing professional nurturing) are those with the greatest adaptability. In short, you get what you pay for.

The analysis was extended from institution type to the length of time that

the respondent has been in the institutional research field. Table 5 displays the Cramer's V scores for variable pairing using tenure in service as the controlling factor. The data suggest that a highly structured role is most important in those instances where the role incumbent is new to the job. For the new practitioner to institutional research, a situation in which a structured set of research activities is in place, a professional authority relationship is well established, professional culture is the expected operating medium, etc. All tend to promote adaptability more than where this is not the case. This is noteworthy for those institutions just beginning an institutional research function (suggesting that a clear concept of those activities desired should be well defined) and for those institutions whose financial circumstances argue for hiring a less experienced person. As with institution type, professional authority is strongly related to adaptability across the board. Professional culture also shows strength across all tenure categories.

In summary, the data in aggregate do not present a resounding affirmation of the research assertions proffered in the rationale for the study. However, when the data are segmented by institution type and respondent's tenure in institutional research, patterns emerge which begin to suggest that the research assertions are not without merit. Clearly, more refined research is called for.

Implications of this Study and Directions for Future Research

The data analysis in this study suggests that, under certain circumstances, structural variables in the institutional research organizational role are associated with the capacity for that organization to adapt to its external environment. The circumstances under which these associations hold true will become clearer as the research begun in this study is refined. The refinement should include the following provisions.

Table 5: Cramer's V for Pairing of Independent with Dependent Variables by Length of Time Respondent has Been in Institutional Research Field

Variable Pairings	Cramer's V					
	All Respondents	Less than One Year	1-3 years	4-6 years	7-9 years	10 or more years
Degree of Role Presence with Organizational Adaptability	0.13081	0.40938	0.30585	0.34665	0.33220	0.25897
Number of Roles Held with Organizational Adaptability	0.18901	0.35355	0.26184	0.30777	0.34169	0.25369
Professional Training with Organizational Adaptability	0.13954	0.29011	0.25954	0.30052	0.29250	0.24721
Professional Authority with Organizational Adaptability	0.26937	0.67741	0.46029	0.47270	0.56851	0.45157
Professional Culture with Organizational Adaptability	0.20512	0.42266	0.41755	0.31329	0.41874	0.30581

The variables in the analysis can be sharpened considerably to yield additional information. The independent variables should be precise in their definition. This study viewed degree of role presence purely as a function of the number of separate research projects regularly carried out by the office. Focusing on the types of projects may enhance the analysis. While some association was found between the number of projects and adaptability, it may be that attrition analyses contribute more to enrollment stability and growth than perfunctory state and federal reporting, marketing analyses more than community impact studies, etc. Sharpening the definition of those projects contributing to organizational adaptability will greatly add to the quality of the findings. Similarly, within the components of role professionalization, professional training and professional culture require additional polishing. In this study, professional training was purely a function of highest degree earned; the higher the degree, the more training acquired. The field of study and its relationship to the functions of institutional research require definition. A master's degree in tests and measurements may be more useful than a doctorate in Asian studies; a bachelor's degree in math/statistics may be more desirable than a master's degree in Philosophy. Along the same line, types of journals read, specific associations in which membership is held, etc., all of which are components of "professional culture" would seem to beg additional definition. Is membership in Association for Institutional Research more valuable to organizational adaptability than American Educational Research Association or Society for Collegiate and University Planning. Is the Journal of Higher Education superior to Research in Education, etc.?

The weakest variable in this study was organizational adaptability. The stability or growth of enrollment from one year to the next is clearly a function of more than the activity of an institutional research office. No attempt was

made to adjust the analysis for such moderating variables as national economic conditions, existing tuition levels, "prestige" factors, etc. Enrollment stability is a basic measure of an institution's adaptability but is subject to external as well as internal forces. Either a more insulated measure of adaptability or an analysis that addresses potential moderators is called for if a precise relationship between role structure and organizational adaptability is to be successful.

The translation of variable measures from essentially nominal level to at least ordinal and preferably internal level will enable use of higher order statistics which will add significantly to relationship definition. Use of parametric correlational and regression statistics will strengthen the total analysis.

Final Summary

This study has begun to empirically confirm, in a post-secondary institutional setting, some of the proposed relationships between boundary spanning role structure and organizational adaptability, as hypothesized by Aldrich and Herker (1979) and earlier organizational theorists. This work will become increasingly important to colleges and universities faced with the uncertain external environment of the 1980's. Those institutions which come to terms with the environment will be those to survive. Institutions which structure roles to monitor the environment greatly enhance their chances for survival and adaptation. This study has begun to define which role structures are most closely associated with adaptability, and under what conditions. Further study should refine that definition and add substantially to the body of literature in organization theory.

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